

REMARKS

Claims 1-10 are pending in the Application. Claims 1, 7, 8, 9, and 10 have been amended in this response without introducing new matter. Claim 4 has been canceled without prejudice and without disclaimer of the subject matter contained therein. Claims 1-3, and 5-10 remain pending.

Applicants note with appreciation the withdrawal of the 35 U.S.C. § 102 rejections, and address only the remaining 35 U.S.C. § 103 rejection.

Claims 1-10 stand rejected under 35 U.S.C. § 103 as obvious over either McCulloch or Kanai for the reasons of record in paper 3. Because the text of that rejection is brief, it is set forth below for convenience:

Claims 1-3 are rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over McCulloch et al or Kanai et al.

The prior art references disclose a process for the separation of isomers of an aromatic compound containing halogens with a zeolite wherein a desorbent is utilized (See Abstract).

It is clear from the teaching of Kanai et al that it is well known in the art to recover and reuse the desorbent (See Fig. 1).

Applicants note that neither the rejection nor the references indicate that the desorbent is cleaned of impurities prior to being reused. This important point was noted in the previous response filed on September 4, 2001.

In response, the latest Action indicates only that

“even in the absence of prior art disclosing the recovery and reuse of the desorbent, it would be obvious to one of ordinary skill in the art to recover and reuse the desorbent because to do so would clearly improve the economic efficiency of the process. With regard to the prior art enabling one of ordinary skill in the art to perform such recovery of the desorbent, it is noted that such procedures are so common and trivial in the art (See Kanai et al, Figure 1) that mere routine experimentation would reveal the most efficient method to one of ordinary skill in the art.”

This represents the entirety of the facts and reasoning presented to show either McCulloch or Kanai suggest the claimed method including removal of impurities in the desorbent prior to reintroduction into the separation process.

Applicants readily agree that it is well known to recover and reuse the desorbent in similar prior art processes. Indeed, Applicants admitted as much in their specification at page 3, line 3. Applicants continued, however, further noting that continued recirculation subjects the desorbent to impurity accumulation which leads to desorbent degradation.

Neither McCulloch nor Kanai recognize the presence of these impurities in the recycled desorbent. Neither McCulloch nor Kanai recognize that such impurities continually accumulate as desorbent is recycled. Neither McCulloch nor Kanai recognize that such continued accumulation leads to the degradation of the desorbent. Neither McCulloch nor Kanai recognize that accumulation of impurities and desorbent degradation can be minimized and/or eliminated by purifying the desorbent prior to reuse. Neither McCulloch nor Kanai teach or suggest purifying the desorbent prior to reuse, as claimed herein.

Applicants respectfully submit that although it was well known to regenerate an absorbent, e.g. by burning, the prior art does not teach or suggest regenerating desorbent by removing impurities. Ordinarily, in prior art practices, impurity-containing desorbents were simply replaced, in whole or in part, by fresh, clean desorbent. As claimed, the invention calls for cleaning and recycling desorbent, rather than continually replacing it.

The original rejection, with reference to Fig. 1 of Kanai, purports to show the recovery and reuse of the desorbent. Fig. 1, however, indicates at 17 only that the desorbent is recovered. There is no indication that it is reintroduced at any of the upper flows. Furthermore, col. 5, lines 17-18 indicate the remaining liquid, presumably containing the desorbent, “was discharged through line 17.” (Emphasis added.)

On the other hand, McCulloch, discloses, at best, separating desorbent from the “feed

components in the extract and raffinate streams.” These, however, are supplied materials and cannot be considered impurities in the context of the disclosure. Thus, there is no teaching or suggestion of the presence or removal of impurities from the desorbent.

Neither McCulloch nor Kanai recognize even the presence of impurities, and certainly cannot appreciate the degrading effect they have on the process or the efficiency obtained through purifying the desorbent prior to reuse.

An analysis of Example 2 and Comparative Example 3, with reference to Fig. 5 and Example 3 and Comparative Example 5 with reference to Fig. 7 emphasizes the advantages of the claimed impurity removal. Fig. 5 clearly shows steady performance of Example 2 over 4 months. In contrast, Comparative Example 3 quickly loses absorption recovery as early as 3 months into its use. Greater losses in efficiency are seen over time. Likewise, Fig. 7 shows the steady recovery rate of Example 3, according to the invention, in contrast to the quick decline of Comparative Example 5, which does not clean and recycle the desorbent. In both comparative examples, the desorbent would have to be replaced almost monthly to achieve the same results as the examples of the invention.

Although Applicants believe this alone is sufficient to patentably distinguish the methods from the prior art, we have further amended the independent claims in an effort to bring about early allowance. Each independent claim has been amended to indicate that the impurities are sufficiently removed to achieve impurity levels at or below 1000ppm by weight. Support for this amendment is found on p. 10, line 13 of Applicants’ specification. No new matter has been added.

In light of their utter silence with respect to the presence or removal of impurities, neither McCulloch nor Kanai can possibly teach or suggest the reduction of impurities, which they do not recognize, to reduced levels of which they do not and cannot attribute any importance.

Applicants respectfully submit that all pending claims are patentable over the prior art and are now in condition for allowance. Early reconsideration and allowance of all pending claims is, therefore, respectfully requested.

Respectfully submitted,



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Version with Markings to Show Changes Made to the Claims

1. (Amended) A method for producing an aromatic compound isomer substituted with alkyl group(s) and/or halogen atom(s), through adsorptive separation by the use of a zeolite-containing adsorbent and a desorbent, wherein the desorbent is, after having been processed for removing impurities from it by a method selected from distillation, purging, or absorption to a solid absorbent to achieve a level below 1,000 ppm by weight, supplied to the adsorptive separation step.

7. (Amended) A method for producing an aromatic compound isomer substituted with alkyl group(s) and/or halogen atom(s), through adsorptive separation by the use of a zeolite-containing adsorbent and a desorbent, wherein the desorbent is, after having been processed for removing oxygen-containing or high boiling point compound impurities from it by a method selected from distillation, purging, or absorption to a solid absorbent to achieve an impurity level of ≤1,000 ppm by weight, supplied to the adsorptive separation step.

8. (Amended) A method for producing an aromatic compound isomer substituted with alkyl group(s) and/or halogen atom(s), through adsorptive separation by the use of a zeolite-containing adsorbent and a desorbent, wherein the desorbent is, after having been processed for removing impurities having an aldehyde group or a carboxyl group from it by a method selected from distillation, purging, or absorption to a solid absorbent to achieve an impurity level of ≤ 1,000 ppm by weight supplied to the adsorptive separation step.

9. (Amended) A method for producing an aromatic compound isomer substituted with alkyl group(s) and/or halogen atom(s), through adsorptive separation by the use of a zeolite-containing adsorbent and a desorbent, wherein the desorbent is, after having been processed for removing impurities produced during adsorptive separation from it by a method selected from distillation, purging, or absorption to a solid absorbent to achieve an impurity level of ≤ 1,000 ppm by weight, supplied to the adsorptive separation step.

10. (Amended) A method for producing an aromatic compound isomer substituted with alkyl group(s) and/or halogen atom(s), through adsorptive separation by the use of a zeolite-containing adsorbent and a desorbent, wherein the desorbent is, after having been processed for removing oxygen-containing or high boiling point compound impurities produced during adsorptive separation having an aldehyde group or a carboxyl group from it by a method selected from distillation, purging, or absorption to a solid absorbent to achieve an impurity level of ≤ 1,000 ppm by weight, supplied to the adsorptive separation step.

Please cancel Claim 4 without prejudice and without disclaimer of the subject matter contained therein.